The Effects of a Language Intervention Program on the Phonological and Word Awareness Skills of Language-Delayed Kindergarten Children

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Abstract

Over the past decade, research has suggested that phonological and word awareness skills (i.e., the ability to reflect on and manipulate the components of language) are important for early reading acquisition. This study examined the phonological and word awareness skills of language-delayed kindergarten children at the beginning and end of a language intervention program using five tasks. The results were compared to the performances of average kindergarten children who did not participate in the language intervention program. There were significant performance differences for all tasks, favouring the average children, at the beginning of the intervention program. However, at the end of the training interval, the language-delayed children performed as well as the average children.

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Dedication

This paper is dedicated to my children in the hopes that this will inspire them to continue to learn.

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CHAPTER ONE: THE PROBLEM

Introduction

Language is a complex construct unique to humans. It allows one to process and produce spoken messages. It is also an important tool for learning. Speaking, listening, reading, and writing are dependent on one's knowledge of language (Ontario Ministry of Education, 1986).

Learning language appears to be a fairly simple process. Most children acquire oral language with little difficulty. However, some children struggle to crack the language code. Preschoolers with delayed language development are likely to be labelled as learning disabled students by Grade Three or Four (Bloom, 1980; Snyder, 1984; Wallach & Liebergott, 1984; Wiig & Semel, 1976, 1984).

Language-delayed students face numerous learning challenges. As the instructional demands of the classroom increase, so do the language demands. Students are expected to use language to describe, comment, question, report, and predict, and orally express their ideas in a coherent and age-appropriate manner. They are also expected to acquire the prerequisite skills for reading and writing acquisition. For language-delayed children, these skills may be severely impaired.

Reading and writing are strongly related to language

(Bloom, 1980; Catts & Kamhi, 1987; Snyder & Downey, 1991; Vellutino, 1979; Wallach & Liebergott, 1984; Wiig & Semel, 1976, 1984). Linguistic awareness skills are also positively correlated with the acquisition of reading (e.g., Blachman, 1984; Bradley & Bryant, 1983; Bryen & Gerber, 1987; Fox & Routh, 1975; Tunmer & Cole, 1985).

Linguistic awareness, or metalinguistic ability, is the ability to deliberately reflect on language as an object, and manipulate its components (Clark, 1978). This ability enables one to focus on the structure of language, and not just the meaning or use of language. Linguistic awareness is viewed as important for language development as it enables one to judge both the grammatic and semantic correctness of sentences, repair communication breakdowns, make language adjustments for different listeners, monitor language comprehension, and understand social rules for using language (Smith & Tager-Flusberg, 1982). More importantly, it provides one with the knowledge that spoken language is composed of words, syllables, and sounds. It also gives one the ability to analyze language into these smaller units.

Phonological awareness, or phoneme awareness, is defined as the ability to reflect upon the structure of words, and manipulate syllables and sounds (Ball & Blachman, 1988). For example, counting the number of syllables, or sounds, in a word would constitute phonological awareness.

It also entails recognizing and generating rhyming words, and deleting and blending sounds (Bryen & Gerber, 1987). Word, or morphological awareness, is the ability to segment sentences into words and appreciate that words are separate from their referents (Bryen & Gerber, 1987).

There is a growing body of research suggesting that phonological awareness, and to a lesser extent word awareness, are powerful predictors of early reading success (Bradley & Bryant, 1983; Fox & Routh, 1975; Lundberg, Olofsson, & Wall, 1980; Mann & Liberman, 1984; Stanovich, Cunningham, & Cramer, 1984). In addition, some studies (Ball & Blachman, 1988; Bradley & Bryant, 1983; Lundberg, Frost, & Petersen, 1988; Olofsson & Lundberg, 1983) have concluded that phonological awareness training facilitates the acquisition of early reading skills. Because children who perform poorly on phonological awareness tasks are at risk for reading difficulties (e.g., Bradley & Bryant, 1983; Stanovich, Cunningham, & Cramer, 1984), the reading problems of language-delayed children may be two-fold. Not only do they lack oral language competence needed for the initial stages of reading development, they may not possess the necessary phonological and word awareness skills.

Background to the Problem

Linguistic awareness is an interesting phenomenon that has generated a considerable amount of curiosity and discussion in the educational field. Over the past several decades, researchers (e.g., Clark, 1978; Fox & Routh, 1975; Hakes, 1980; Liberman, Shankweiler, Fischer, & Carter, 1974;) have explored the development of linguistic awareness in children. Its relationship to reading has also been investigated. There is sufficient evidence positively correlating tasks that measure children's ability to reflect upon and manipulate the structure of language to reading success (e.g., Ball & Blachman, 1988; Bradley & Bryant, 1983; Fox & Routh, 1975; Stanovich, Cunningham, & Cramer, 1984).

To date, the research has focused on children who have intact oral language systems. However, not all children are competent language users. Despite normal hearing, average to above average intelligence, and the absence of physical ailments, some children experience severe delays in language acquisition (Aram & Nation, 1980; Aram, Ekelman, & Nation, 1984; Hall & Tomblin, 1978). Receptive and expressive language difficulties are well described (e.g., Cole & Cole, 1981; Fey, 1986; Lahey, 1988; Wiig & Semel, 1984; Wood, 1982). Receptive language is the ability to understand spoken messages. Children with receptive language

difficulties are often described as lazy and have trouble following directions (Cole & Cole, 1981). Expressive language refers to the ability to effectively communicate spoken messages. Children with expressive language difficulties refrain from oral interactions. They also use immature grammar and have trouble relating personal and sequential events (Cole & Cole, 1981).

The relationship between receptive and expressive language delays and reading difficulties is no longer debated. Language plays an important role in learning to read (e.g., Vellutino, 1979; Catts & Kamhi, 1987; Wiig & Semel, 1984).

Purpose and Rationale

The phonological awareness skills of the language-delayed population requires examination for several reasons. First, there is ample evidence suggesting that it is a powerful predictor of reading success (e.g., Ball & Blachman, 1988; Bradley & Bryant, 1983; Fox & Routh, 1975). Second, the language and reading difficulties of language-delayed students suggest that these children may have linguistic awareness deficits, particularly phonological weaknesses. However, few studies have examined the phonological and word awareness abilities of language-delayed students. Third, students are expected to

conceptualize that sentences are made up of words, and that words are made up of syllables and sounds. They are also expected to manipulate these components. For example, teachers may ask students to rhyme words or think of words that start with a particular sound. These tasks require linguistic awareness abilities (Lewkowicz, 1980). It is assumed that students are able to reflect on their knowledge of the structure of language and analyze language into words and sounds.

The linguistic awareness skills of the language-delayed population warrants further investigation, not only because of its relationship to reading, but also because of its relationship to language intervention and classroom programming. Special educators, classroom teachers, psychologists, and speech-language pathologists face the challenge of assessing language-delayed students and planning language programs for them. As a result, program modifications and specific programs are designed for these students. Strategies to facilitate linguistic awareness are often addressed. It is also often assumed that children's linguistic awareness skills will improve with specific language programming.

In the Halton Board of Education, language-delayed kindergarten children may participate in a group language intervention program. The program is offered twice weekly in addition to the regular kindergarten program. Activities

are designed and modified given the language needs of the children. Both explicit and implicit (i.e., formal and informal) educational approaches are used. Because of the research supporting a positive relationship between language and reading acquisition, and reading and phonological awareness, tasks to facilitate phonological awareness are also included. There is also growing evidence suggesting there are positive effects of intervention programs that focus on phonological awareness skills (e.g., Ball & Blachman, 1988; Lundberg, Frost & Petersen, 1988).

Despite the overwhelming amount of evidence suggesting that phonological awareness plays an important role in learning to read, few researchers have evaluated the phonological awareness skills of language-delayed children. Presumably, these children will experience difficulty reflecting on, and manipulating, words, syllables, and sounds.

Research Questions

1. Does a general language intervention program facilitate the word and phonological awareness abilities of language-delayed children?
2. Do performances on word and phonological tasks differ between language-delayed and average children as a function of task?

For the purpose of this study, language-delayed students referred to students who have been identified by a qualified speech-language pathologist as having significant difficulties with expressive language in the absence of obvious cognitive, physical, social, or emotional problems.

Scope of the Study

This study examined the phonological and word awareness skills of language-delayed children, before and after they participated in a language intervention program. The results were then compared to a group of children with average language ability, who received only the regular kindergarten program.

These findings were not intended to be generalizable to the general language-delayed population. Controlling for factors that affect linguistic awareness, such as the effects of intelligence, and using a larger sample size would improve the generalizability of the findings.

This study did not attempt to predict reading ability. Instead, it was an initial start to understanding the phonological and word awareness skills of language-delayed children. It is hoped that the findings will be used to plan appropriate language programs and assessment batteries for language-delayed children.

Outline of Subsequent Chapters

Chapter Two consists of a review of the literature as it relates to linguistic awareness and language-delayed students. It summarizes difficulties that language-delayed students encounter, the development of linguistic awareness, the role of linguistic awareness for reading, and the linguistic awareness skills of language-delayed students.

Chapter Three outlines the methodology used. Specifically, this chapter includes a description of the sample, materials, procedure, and data analysis.

The findings are presented in Chapter Four, followed by a discussion of the results and their implications for education in Chapter Five. Recommendations for further research are also discussed in this final chapter.

CHAPTER TWO: LITERATURE REVIEW

Introduction

The importance of language for learning has interested educators for many years. Its relationship to learning and reading is no longer debated (Ontario Ministry of Education, 1986). However, recent findings suggest that, in addition to the acquisition of basic language skills, the ability to reflect on and manipulate language also plays an important role in learning to read.

This chapter defines the language-delayed population and linguistic awareness. The development of linguistic awareness and it relationship to reading success are discussed. Major conclusions regarding linguistic awareness and language-delayed children are presented.

Language-Delayed Children

Language-delayed children experience difficulties with the comprehension and/or production of language form, content, and/or use (Bloom, 1980; Fey, 1986). The <u>form</u>, or structure, of language refers to the phonological, morphological, and syntactical rules used by a speaker or listener.

<u>Phonology</u> refers to the speech sounds of a language

system and the rules that govern speech sound combinations. It also includes the intonational patterns of speech. Morphology is defined as the study and description of word formation. A morpheme is the smallest unit of speech that conveys meaning. For example, "cat" is one word composed of three phonemes and one morpheme. However, "cats" is one word composed of four phonemes and two morphemes. The "s" part of the word changes the meaning of "cat," and therefore, is one morpheme.

Syntax refers to grammar. It involves the rules for forming sentences. Content is the study of word meanings, relationships between words, and the underlying meaning of words. It is referred to as semantics. Language use is the why, where, and when of language. It is referred to as the pragmatics of language.

Language-delayed children have been called language disordered, language impaired, language disabled, and language-learning disabled (Bloom & Lahey, 1978; Wood, 1982). The complex nature of language has contributed to this lack of consensus. For the purpose of this paper, the term language-delayed will be used.

Describing language-delayed children is also difficult. Language difficulties vary from one child to the other. Children's language difficulties may be very obvious or quite subtle. However, many language-delayed exhibit common characteristics. As preschoolers, language-delayed children

may have trouble forming sounds and combining sounds to form words. They may use only one or two words to communicate, omit words, and/or change the order of words as they speak.

Wiig and Semel (1984) contend that language-delayed preschoolers are often viewed as lazy, stubborn, or immature by their parents and teachers. These authors also suggest that language-delayed children are reticent about using language and enter kindergarten without knowledge of colours, numbers, or common vocabulary. Difficulties may also be apparent in following directions and routines. As well, they display obvious expressive language errors, particularly in the morphological and syntactical systems.

As these children progress through the primary grades their oral language difficulties may subside. However, reading and writing problems may persist or emerge. Once they enter the junior and intermediate grades, the structure of their oral language may appear intact and functional. However, subtle oral language difficulties may be evident. For example, difficulties organizing ideas to relate a story or narrative, understanding figurative language, and retrieving words from long-term memory may be apparent (Wiig & Semel, 1984).

The receptive and expressive language difficulties of young children have sparked considerable interest in educators. The research, documenting ongoing language-learning difficulties (e.g., Aram, Ekelman, &

Nation, 1984; Hall & Tomblin, 1978; Nippold & Fey, 1983; Wiig & Semel, 1984), has encouraged investigations of the relationship between language and reading.

Language and Reading

The oral language difficulties of children have been well documented (e.g., Bloom & Lahey, 1978; Fey, 1986; Snyder, 1984; Wilcox, 1984). Speech-language pathologists, special educators, and classroom teachers have noted that many language-delayed kindergarten children continue to have language difficulties throughout the primary and junior grades. Empirical evidence (e.g., Aram & Nation, 1980; Aram, Ekelman & Nation, 1984; Donahue, Pearl, & Bryan, 1982; Hall & Tomblin, 1978; MacLaughlin & Chapman, 1988; Nippold & Fey, 1983) supports these observations. Children with reading and writing difficulties may have subtle oral language difficulties or a history of delayed speech and language. Presumably, children with oral language deficits are at risk for reading and writing difficulties.

Although earlier theories of reading development have focused on the visual perceptual skills needed for reading, there is now a general consensus that language, too, has a critical role (Tunmer & Cole, 1985; Vellutino, 1979). This has been supported by researchers (Bryne, 1981; Seidenberg & Bernstein, 1986; Wiig & Semel, 1974), who found that poor

readers demonstrate difficulties understanding grammar, figurative language, and vocabulary. Difficulties in forming sentences and oral narratives have also been observed (Roth & Spekman, 1986; Wiig & Semel, 1975).

Not all reading disabled children experience difficulties with oral language acquisition. Current theories hypothesize that reading disabled children may have a limited knowledge of linguistic awareness. More specifically, they are unable to process, retrieve, and reflect upon the phonological make-up of language (e.g., Kamhi & Catts, 1986; Mann, Cowin, & Schoenheimer, 1989; Tunmer & Cole, 1985; Vellutino, 1979; Wagner, 1986). Recent findings have supported a strong positive correlation between phonological awareness and reading success. In order to better understand this relationship, the next section describes the development of linguistic awareness.

Definition of Linguistic Awareness

Linguistic awareness is the ability to reflect upon the structure of language and manipulate its components (Clark, 1978). Bryen and Gerber (1987) have classified the levels of linguistic awareness into four broad categories. The first level is pragmatic awareness which includes the ability to repair communication failures and recognize message inadequacies. The next level is form awareness, the

ability to judge the semantic and grammatical acceptability of sentences. The ability to segment sentences into words, separate words from their referents, appreciate jokes, recognize synonyms and antonyms, and substitute words constitutes word awareness, the third level. The fourth level is phonological awareness, the ability to segment words into syllables and phonemes, recognize rhymes, delete and substitute phonemes, and appreciate puns.

The Development of Linguistic Awareness

The development of linguistic awareness has been well debated over the past two decades. Two primary schools of thought exist. The first contends that linguistic awareness, particularly the ability to make judgments about the structure of language, does not develop until age six or seven (Blachman, 1984; Hakes, 1980; Liberman, Shankweiler, Fischer, & Carter, 1974). The second and more popular theory views linguistic awareness as developing simultaneously with oral language development (Clark, 1978; Fox & Routh, 1975; Rubin, Mallory, & Farndale, 1987; Smith & Tager-Flusberg, 1982; Zhurova, 1973).

Studies supporting the first theory found that preschoolers were unable to segment spoken sentences into words, syllables, or phonemes. However, the second school of thought challenged this finding, and reported signs of

phonological awareness in children as young as three years old. These studies simplified the phonological awareness tasks. For example, Fox and Routh (1975) studied the ability of children, between the ages of three and seven years, to analyze language into words, syllables, and phonemes. Instead of tapping the number of syllables and phonemes, the procedure used by Liberman et al. (1984), Fox and Routh had the children orally segment spoken words. That is, the subjects were instructed to say a word or syllable and then asked to say a little bit of it. Unlike Liberman et al., Fox and Routh found that even three-year-olds showed some ability to analyze the structure of language. However, they noted a marked improvement in the four-year-olds' ability to segment sentences into words and syllables. There was also a significant improvement in the children's ability between the ages of three and six years to segment syllables into phonemes.

These results suggest that segmenting sentences into words, and words into syllables are easier tasks than segmenting words into phonemes. The ability to segment words into syllables was also found to be strongly related to age, receptive vocabulary knowledge, and reading comprehension.

Fox and Routh's (1975) findings, along with Smith and Tager-Flusberg (1982), have provided insight into the analysis skills of children, and suggest that children are

capable of analyzing language into its structural components at an early age, even before reading instruction. It also appears that the method used to assess phonological awareness may affect whether or not children demonstrate this ability.

The evidence supporting signs of linguistic awareness in young children has led to the development of a continuum. Clark (1978) proposes that children develop implicit skills and progress to skills that require an explicit awareness of language structure. Early signs of linguistic awareness may occur at two years of age, when children repair and monitor the results of their utterances. Children then are capable of judging the language productions of others. The next level involves judging the correctness of spoken utterances. Identifying and manipulating the grammar, words, syllables, and sounds of spoken language occur at the next level. The final stage, around age six or seven years, includes the ability to explain the manipulations, and form riddles and puns.

Recently, Rubin, Mallory, and Farndale (1987) added support to Clark's (1978) theory. They examined the development of phonological and morphological awareness in children with average language ability. Their subjects were three to six years of age. Results suggested that both levels of linguistic awareness appear to develop gradually along a continuum. Children progress from making judgments

about language errors to identifying, and then repairing the errors. The next level includes manipulating grammar, words, and then phonemes. The ability to explain the manipulations marks the end of the continuum. Although more research is needed, current thinking supports the notion that linguistic awareness skills develop along a continuum from the most implicit, such as making self-corrections, to more explicit levels, such as counting the number of syllables in a word.

Phonological Awareness and Reading

The relationship between linguistic awareness and reading has intrigued researchers for the past two decades. Tunmer and Cole (1985) suggest that each type of linguistic awareness is related to a different stage of reading acquisition. However, some studies (e.g., Bradley & Bryant, 1983; Lundberg, Olofsson, & Wall, 1980; Mann & Liberman, 1984; Stanovich, Cunningham, & Cramer, 1984) have reported phonological awareness as being a precursor to reading success.

Bradley and Bryant (1983) contend that preschoolers, who are insensitive to rhyme and sounds, are at a disadvantage when they are learning to read and write. Their longitudinal study examined the sound categorization abilities of four- and five-year-old children, and their

reading and spelling skills three years later. Children who performed better on a sound categorization task made more progress in reading and spelling than those children who performed poorly on this task. The same results occurred when the influences of memory and intelligence were controlled.

Similarly, Mann and Liberman (1984) presented their subjects with a syllable counting task and a memory test at the end of their kindergarten year. The same children were given reading tests at the end of Grade One. As first graders, the children were assigned to one of three groups based on reading ability: good, average, and poor readers. Findings revealed that 85% of the good readers passed the syllable counting test. However, only 56% of the average readers and 17% of the poor readers reached criterion on this test. These findings not only support the correlation between phonological awareness and reading, but they strongly suggest that reading ability may, in fact, be predicted by certain phonological tasks.

The predictive power of phonological awareness for early reading success was further supported by Stanovich, Cunningham, and Cramer's (1984) findings. They presented forty-nine children with ten phonological tasks and reading tests at the end of their kindergarten year. Three of the tasks measured rhyming. Seven assessed phoneme manipulation. Thirty-seven of the original group were

then given a reading test at the end of Grade One. The seven phoneme manipulation tasks were reported to be highly predictive of reading in Grade One. The rhyming tasks were not as useful. The level of difficulty of each phonological task was also addressed. The three rhyming tasks were found to be the easiest tasks. The six tasks, measuring the ability to compare the initial and final phonemes in words, were moderately difficult. The task requiring the deletion of the initial sound in a word, and then saying the embedded word, was the most difficult. The seven non-rhyming tasks were also highly interrelated, suggesting they tested a similar phonological construct. The rhyming measures, however, did not correlate with these seven tasks.

To establish a causal relationship between phonological awareness and reading, Bradley and Bryant (1983) completed a training study. They chose 65 children from their sound categorization study (1983). These children scored at least two standard deviations below the mean on the sound categorization task, and showed no signs of reading on formal measures at the onset of the study. The children were assigned to one of four groups. One group received sound categorization training. A second group received sound-symbol relationship training, in addition to the sound categorization training. The third group received traditional conceptual categorization training. That is, they were taught to group words together that shared the

same characteristics. The fourth group served as a control. Training children in sound categorization had a significant effect on their reading and writing development. The group that received the sound-symbol correspondence training performed the best on reading and writing measures. Bradley and Bryant concluded that sound categorization training can improve the reading and writing skills of non-readers, particularly when sound-symbol relationships are explicitly addressed.

Findings from other studies (e.g., Lundberg, Frost, & Petersen, 1988; Olofsson & Lundberg, 1983) have supported Bradley and Bryant's (1983) results. Lundberg et al. (1988) examined the effects of a linguistic training program prior to reading instruction and its effect on later reading achievement. Approximately 400 children, with an average age of six years, were randomly assigned to one of two groups. One group received daily phonological awareness sessions and the other received no specific programming. The children were presented with seven phonological measures before and after the training. Reading and spelling abilities were tested in Grades One and Two. At the onset of the experiment both groups performed poorly on the phonological measures. However, at the end of the training period, the experimental group outperformed the control group. The researchers concluded that phonological awareness skills can be trained. Evidence supporting a

causal relationship between phonological awareness skills and reading was also evident. These results support those reported by Olofsson and Lundberg (1983). Unlike Olofsson et al., Lundberg et al. (1988) attempted to control for the effects of maturation, intelligence, language, prior reading experiences and socio-economic status. As a result, the gains made by the children can be attributed to the phonological awareness training program.

Similarly, Ball and Blachman (1988) investigated the effects of phonological awareness training with kindergarten children. Thirty children were randomly selected and assigned to one of three training groups. Unlike Olofsson and Lundberg (1983), these researchers did not include children who were considered to be readers. They also excluded children who scored below 1.5 standard deviations on a receptive language vocabulary test. The first group received the phonological training program, consisting of twenty minute group sessions four times a week, for seven weeks. A second group received a general language training program for seven weeks. Language activities, focusing on general vocabulary development, listening, and letter names and sounds, were emphasized in this program. Both groups received letter sound training. A third group served as a control. Reading, phonological segmentation, letter name knowledge, and letter sound tests were administered to the children before and after the training. Results suggested

that the phonological training group performed better than the language stimulation and control groups on the phonological segmentation task. There were no significant differences among the three groups on letter name knowledge, whereas significant differences on the letter sound knowledge test were found between the two treatment groups and the control group.

Studies examining the effects of phonological awareness programs offer strong evidence that phonological awareness can be trained prior to reading instruction. In addition, they support the hypothesis that children who are more adept at phonological awareness tasks are more likely to experience initial reading success.

Phonological Awareness and Language-delayed Children

The evidence supporting the importance of phonological awareness for reading success has motivated investigators to explore the linguistic awareness abilities of language-delayed children. Presumably, language-delayed children may have trouble manipulating and reflecting upon phonemes or syllables if they are omitting these structures in their spontaneous speech.

Kamhi and Koenig (1985) studied the ability of language-delayed students to make judgments of language content and form. Language-delayed children and children

with average language ability were asked to identify and correct sentences which contained syntactic, semantic, and phonemic errors. For example, the children were presented with a sentence that contained a misarticulated word and were expected to identify the error. Significant differences between the two groups, favouring the children with average language ability, were reported. Consistent with Rubin et al.'s (1987) findings, syntactical and morphological judgment tasks were more difficult than were phonological ones. Rubin et al. explains that phonological errors are perhaps more obvious as they change the meaning of the word. Specifically, phonological errors often result in a non-word, whereas morphological errors result in a word similar to the original. For example, "The boys are coming," is similar in meaning to "The boy are coming," or "The boys is coming." However, "Eat your thupper," differs in meaning from, "Eat your supper."

Further studies (Kamhi, Lee, & Nelson, 1985; Warrick & Rubin, 1992) found that children with average language ability outperform language-delayed children on a variety of linguistic awareness tasks. Kamhi et al. investigated the word, syllable, and phoneme segmentation skills of language-delayed children. Two groups of children with average language ability were matched to a language-delayed group. One group was matched by language age, and the other by mental age. The language-matched controls were on average

46 months old, whereas the average age for the language-delayed was 68 months. The children were asked to orally divide sentences into words, words into syllables, and monosyllabic words into phonemes. They found that the children with average language ability, who were matched by mental age, outperformed the language-delayed children on all three tasks. The language-matched group, who were chronologically younger than the language-delayed group, also performed significantly better than the language-delayed group on all three tasks.

Other studies (Kamhi & Catts, 1986; Kamhi, Catts, Mauer, Apel, & Gentry, 1988) support the notion that language-delayed children experience difficulty analyzing language into words, syllables, and phonemes. Kamhi and Catts (1986) compared the performance of language-delayed children to reading-delayed children on tasks measuring word and phonological awareness. Their subjects were 12 poor readers, 12 language-delayed, and 12 average children who ranged in age from six to nine years. The three groups were matched for mental age. To be considered reading-delayed, children had to perform at least one year below grade level on at least two of the three subtests from the Woodcock Reading Mastery Tests. The reading-delayed children also had to demonstrate average language ability on the Test of Language Development-Primary.

The children were asked to delete initial and final

phonemes (elision), segment words into phonemes by tapping, and orally segment sentences into words, words into syllables, and monosyllables into phonemes. Performance of the average children was significantly better than the reading-delayed on the sentence segmentation and elision tasks. There were no significant differences between the reading- and language-delayed groups for any task. However, the reading delayed group may have had subtle language difficulties, such as discourse planning or language processing problems. These difficulties may explain why significant differences between the reading- and language-delayed groups were not evident.

In contrast to Kamhi and Catts (1986), Kamhi et al. (1985) found a substantial difference between average and language-delayed students' ability to segment sentences, words, and phonemes. A closer examination of the two studies explains this discrepancy. Kamhi et al. used subjects who range from three to six years of age, whereas Kamhi and Catts' (1986) subjects were between six and nine years of age. Clark (1978) believed that there is a steady growth in linguistic awareness as children mature, particularly in the ability to analyze language into its structural parts. The age difference between the two samples may have affected the findings. Kamhi and Catts had older children, who may have had more time and language experiences to help develop their word and phonemic

awareness skills. The older children may have also had better oral language skills, in relation to syntax and morphology, giving them more knowledge on which to reflect. These skills may have influenced their ability to segment sentences into words.

In summary, it is evident that the language-delayed preschooler is at risk for later language and reading difficulties (e.g., Aram & Nation, 1980; Bloom, 1980; Wiig & Semel, 1976, 1984). The acquisition of early reading skills appears to be somewhat dependent upon oral language development. In addition, phonological awareness, the ability to reflect on and manipulate syllables and sounds, is positively correlated with early reading success (e.g., Bradley & Bryant, 1983; Fox & Routh, 1975; Stanovich, Cunningham, & Cramer, 1984). Training phonological awareness also has positive effects on early reading (e.g., Ball & Blachman, 1988; Lundberg, Frost, & Petersen, 1988). Research has also found that language-delayed children are, in fact, delayed in their acquisition of phonological awareness skills. Further research into the phonological awareness skills and the effects of training programs for language-delayed children is urgently needed.

CHAPTER THREE: METHODOLOGY

This chapter outlines the research methodology used in this study including the sample, materials, procedure, and data analysis. It also presents the methodological assumptions and limitations of the study.

Sample

Thirty kindergarten children from the Halton Public Board of Education participated in this study. The children were assigned to one of two groups.

The children selected for Group One were referred by their teacher to a speech-language pathologist for a language screening. Subsequent testing confirmed these students had an expressive language delay, but not a receptive language or cognitive delay. Fifteen children met the above criteria. Three children left the Halton region, leaving 12 children (M age = 64 months), 10 males (M age = 64 months) and 2 females (M age = 62 months) in this group. Eight of the children attended kindergarten classes and a language intervention program in Burlington. Four attended kindergarten and the same language intervention program in Oakville.

The second group was comprised of fifteen children (M age = 65 months), 13 males (M age = 64 months) and two

females (M age = 68 months). They were randomly selected, except for gender, from 48 Burlington students. All of the children attended the same school and received their kindergarten program from the same teacher. Because the children's teacher did not refer them for a language screening, they were considered to have average language ability.

Language Assessment Procedure

Several instruments were used to assess receptive and expressive language skills of the children referred by their teacher for a screening. Specifically, the Kindergarten Language Screening Test (Gauthier & Madison, 1986), was first used as a cursory examination of the children's receptive and expressive language skills. The Test for Auditory Comprehension of Language-Revised (TACL-R; Carrow-Woolfolk, 1985) and the Structured Expressive Language Test-II (SPELT II; Werner & Kresheck, 1983) were subsequently used to further measure receptive and expressive language skills.

The TACL-R is a reliable (test-retest r = .89 to .95; split-half r = .95) and valid (concurrent r = .76) measure for identifying children with language difficulties (Carrow-Woolfolk, 1985), and is the preferred receptive language tool of the Halton Board of Education's speech department.

However, it does not measure such sensitive features of comprehension, like figurative language or auditory processing. Because some expressively language-delayed children may demonstrate subtle receptive language weaknesses, classroom observations were occasionally used to supplement the TACL-R findings.

The SPELT-II was implemented because of its high test-retest reliability (r = .85) and split-half reliability (r = .82 to .87; Werner & Kresheck, 1983). It is also a valid measure of children's expressive syntactical abilities (concurrent r = .86). This test assesses a wide range of early and later developing morphological and syntactical structures (Werner & Kresheck, 1983). These skills are often impaired in young language-delayed children (Wiig & Semel, 1984). It also uses photographs to elicit structures, allowing for more spontaneous productions from children compared to imitation or sentence completion tasks (Berryman, 1989). However, some caution must be used when administering the SPELT-11, as a control group was not used when the authors assessed the SPELT-11's sensitivity to intervention gains (Berryman, 1989).

To limit the effects of comprehension on linguistic awareness, the children who participated in the present study received a score that fell within 1.5 standard deviations of the mean on the TACL-R. Children also received a score on the SPELT-II that was 1.5 standard

deviations below the mean. Presumably, these criteria ensured that the language-delayed children who participated in this study demonstrated average receptive language ability and expressive language weaknesses. The children in the average language group were not given these language measures.

Language Intervention Program

The Halton Board of Education's Speech and Language Intervention program was used in this study. This program offers language intervention to small groups of children twice weekly. The program supplements children's regular kindergarten program. That is, a student attending kindergarten classes in the morning would attend two afternoon intervention sessions. An afternoon student would attend two morning sessions. Each session is approximately two and a half hours long.

Each group has eight children with one speech-language pathologist and teacher. Children are grouped according to their predominant language difficulty. This results in fairly homogenous groups. For example, children with severely delayed receptive language would be grouped together, if possible, with other children who have similar needs. However, children with delayed articulation, but average receptive language ability, would not be grouped

with receptively language-delayed children. Four primary difficulties are considered when the children are assigned to groups: articulation, expressive language, receptive language, and multiple delays. The 15 language-delayed children who participated in this study had delayed expressive language development. Only the language-delayed children selected for this study received the intervention.

Rationale and Program Design

The primary focus of the language intervention program is to better prepare children for the language demands of the classroom using small group language intervention. Children's receptive and expressive language strengths and weaknesses are identified. Because research has demonstrated that group language intervention programs can be more effective and allow for language to be learned in a more meaningful, flexible, natural, and spontaneous manner than individual support (e.g., Feinberg, 1981; Fey, 1986; Illerbrun, Cowan, & Hosking, 1988), small groups are used. Small groups allow for constant redirection, immediate modification of an activity, repetition of an activity, and constant language modelling. Group intervention also gives the children a supportive environment that promotes risk taking.

Because the children's language profiles are unique,

the general program design and activities are derived from the assessment results. For example, children with receptive language difficulties may require activities to facilitate their understanding of concepts, vocabulary, and grammar. However, children with expressive language weaknesses may need support for forming sounds, constructing sentences, and using language socially. As a result, children with a limited knowledge of vocabulary may have longer play periods and more field trips relative to children with articulation delays, who require more opportunities to learn new sounds. Phonological and word awareness activities are incorporated into these tasks when appropriate. For example, after the children greet each other, a follow-up activity may involve clapping the parts (i.e., syllables) in each person's name. Another activity may involve explicitly talking about the words in our "hello" song. For example, instead of saying "I am fine" in response to "How are you?", the teacher may ask the children to change the little word "fine."

Daily Schedule for the Language Intervention Program

Each program uses four to five general activities each day. Sessions usually begin with 20 minutes of play. This facilitates the social use of language skills and the acquisition of new vocabulary. It also provides

opportunities to practise newly acquired language skills in a meaningful environment. Circle time focuses on attending, listening, answering questions, sequencing ideas, and relating personal experiences. Songs, stories, and games, may be included at this time. For example, a story, with simple vocabulary and grammar, may be read to children who have receptive language problems. Questions focusing on the content of the story may be asked. To ensure understanding, the children may be asked to retell the story using a flannel board. A song may also be used to supplement the story.

Following circle, the children are separated into two groups of four children. One group works with the speech-language pathologist, and the other, with the teacher. Specific language goals are addressed using games, crafts, stories, or dramatic play. For example, if children do not use the question form, "Is it...?", then they may play a guessing game. This game would involve looking for objects in different coloured boxes. Each time children ask a question, they are encouraged to use a colour word and the question form, "Is it...?". A follow-up activity may include going on a treasure hunt using the same question form. Phonological or word awareness skills may be incorporated into this time by having the children count the number of words in their questions.

Snack time follows small group work. This is a

meaningful activity that facilitates the understanding of new words, forming questions, using new words, sequencing, and using language socially. For example, when making individual pizzas at snack, the children are not only learning how to make pizza but they are hearing and using new words, such as "slicing," "olives," "waiter." Pretending to order pizza on the phone also promotes requesting and asking appropriate questions, such as "Can I have pepperoni?". Phonological and word awareness may be incorporated into snack by having the children guess what the snack will be. This may be done by giving them initial sound clues. Another activity may entail counting the parts in each snack item and comparing long words with short words. Following snack, small group work is repeated with the alternate group. The day closes with a short circle.

Support for Linguistic Awareness Activities

Although researchers have found that intervention programs facilitate the language development of children (e.g., Illerbaum, Cowan, & Hosking, 1988; Nye, Foster, & Seaman, 1987), only a few have examined the benefits associated with programs that include linguistic awareness activities. Preliminary findings suggest that phonological awareness activities facilitate the development of phonological awareness (e.g., Bradley & Bryant, 1983;

Lundberg, Frost, & Petersen, 1988; Olofsson & Lundberg, 1983). Ball and Blachman (1988) also found that a general language program, with activities promoting vocabulary development and listening, facilitated letter-sound awareness, a phonological awareness skill.

Research has suggested that children with language difficulties are likely to experience reading failure (e.g., Aram & Nation, 1980; Hall & Tomblin, 1978; Wiig & Semel, 1984). Evidence also supports a positive correlation between phonological awareness and reading success (e.g., Bradley & Bryant, 1983; Mann & Liberman, 1984; Stanovich, Cunningham, & Cramer, 1984). Because of the above findings, the language intervention program used in the present study included word and phonological awareness activities. However, because the focus of the program is to enhance the receptive and expressive language skills of children, word and phonological awareness activities were incorporated intermittently, rather than spontaneously, rather than using daily phonological awareness activities. For example, after reading the story, Brown Bear, Brown Bear, What Do You See? (Martin, 1983) the children may be given a picture of an animal and asked to clap the number of syllables in the animal's name. Another activity may involve describing a word like "caterpillar" as a long word and a word like "bat" as a short word. It is estimated that the children receive approximately two to three hours per week of phonological

and word awareness training.

Dependent Measures

Findings suggest that phonological awareness and, to a lesser extent, word awareness have a crucial role in learning to read (e.g., Bradley & Bryant, 1983; Fox & Routh, 1975; Lundberg, Olofsson, & Wall, 1980; Mann & Liberman, 1984). Researchers, examining these skills in young children, have employed a variety of assessment tools. Their batteries have ranged from rhyming, segmenting sentences, and blending phonemes to categorizing sounds, judging grammar, and answering word knowledge questions (e.g., Bradley & Bryant, 1983; Kamhi, Lee, & Nelson, 1985; Warrick & Rubin, 1992).

After reviewing previous research and the assessment tools used by the Halton Board of Education's speech department, one word awareness task and four tasks measuring phonological awareness were selected to assess the effectiveness of the language intervention program reported here. Specifically, the following five tasks were used: Segmenting Sentences, Rhyme Supply, Initial Consonant Same, Generating Words, and the Rosner 13-Item Test.

Word Awareness Task

Word awareness was measured using the Segmenting Sentences subtest from The Analysis of the Language of Learning (ALL) (Blodgett & Cooper, 1987). This subtest requires children to orally segment sentences into words by pointing to pictorial squares. Blocks, rather than squares, were used for the present study. For example, the sentence, "Tie your shoes." would be said to children. The children would then move one block for each word as they repeat the sentence. After four practice items, 12 test sentences are used. Sentence length varies from three to nine words. The sentences do not progress in difficulty.

Blodgett and Cooper report satisfactory test-retest reliability ($r = .86$). The test was developed after reviewing the development of linguistic awareness and language ability. As reported by the authors, this subtest was able to effectively discriminate between normal and language-delayed children ($p < .01$).

This task was chosen because of the research supporting the relationship between word awareness and learning to read (e.g., Bryen & Gerber, 1987; Tunmer & Cole, 1985; Wagner, 1986). Segmenting sentences tasks have also been utilized by past researchers (e.g., Fox & Routh, 1975; Kamhi et al., 1985; Kamhi & Catts, 1986).

Phonological Awareness Tasks

Rhyme Supply Task

The Rhyme Supply task used by Stanovich et al. (1984) was selected. This task requires children to generate a word that rhymes with a given target word. For example, the children are asked to think of a word that rhymes with "fish." Following an example, children are then presented with 10 test items.

Stanovich et al. (1984) reported high reliability (split-half reliability r = .90) for their three rhyming tasks. Rhyming tasks have been used by other researchers (e.g., Smith & Tager-Flusberg, 1982; Warrick & Rubin, 1992) and are reportedly the easiest of the phonological tasks (Clark, 1978; Rubin, Mallory, & Farndale, 1987; Stanovich et al., 1984). A rhyming task was selected because it can be used to measure emergent phonological awareness skills in preschool children (Clark, 1978; Warrick & Rubin, 1992.

Initial Consonant Same

The Initial Consonant Same Task from Stanovich et al.'s (1984) study was also used. This task requires children to select, from among three words, the one word that has the same initial sound as a target word. For example, the

children hear the word and see a picture of a "goat." They then are shown a picture of a "fish," "goose," and "truck," and asked to choose the picture that starts the same as "goat." Three examples are given, followed by 10 target items. Although Stanovich et al. did not use pictures for the choice words, they were used in the present study to decrease demands on working memory. Pictures were chosen from the SPARC-II (Thomsen, 1982).

Stanovich et al. reported the split-half reliability coefficient to be .83 for this task. Similar sound categorization tasks have been used to measure phonological awareness (e.g., Bradley & Bryant, 1983). Sound categorization tasks also appear to be typical pre-reading activities for primary children, that is, tasks that require children to classify words by initial or final sounds. For example, having children tell you which word does not belong to the group of words, "house," "hat," "hair," or "snake," would entail sound categorization.

Generating Words

The Generating Words subtest from The Analysis of the Language of Learning (ALL) (Blodgett & Cooper, 1987) was administered to assess a child's awareness of sounds. This test requires children to choose a word that begins with a target sound and a word that ends with a particular target

sound. For example, children would be given the sound "sh" and then asked to think of a word that starts with this sound. They would also be asked to think of a word that ends with "g." Two examples and four test items are used to assess children's ability to generate words that start with a target sound. Two examples and eight test items are administered to assess children's ability to generate words that end with a target sound. The authors report acceptable reliability (test-retest r = .39 to .92). This subtest appears to tap a skill that is often used by primary teachers as a pre-reading skill (Lewkowicz, 1980).

Rosner 13-Item Test (Rosner)

This test, also known as the Test of Auditory Analysis Skills (Rosner & Simon, 1971), assesses children's awareness of syllables and sounds. Following two examples, it has 13 items that increase in difficulty. The test begins with items that require children to orally segment words into syllables. It then progresses to sound analysis. These targets require children to delete initial, final, and then medial sounds and say the remaining word. For example, children would be asked to say "cowboy" and then be asked to say it again without saying "cow." Testing is discontinued following two consecutive errors. The total score can be compared to an expected score representing each stage of

development. For example, a total score of three suggests children are capable of analyzing words into syllables but are unable to analyze syllables into sounds. Kindergarten children are expected to be able to analyze words into syllables.

The Rosner has an acceptable level of internal consistency (r = .78) (Yopp, 1988). Given that very few phonological awareness tests exist, the Rosner is often used by psychologists and speech-language pathologists in school boards. Segmenting words into syllables and segmenting words into sounds have been used by many researchers (e.g., Fox & Routh, 1975; Smith & Tager-Flusberg, 1982; Kamhi, Lee, & Nelson, 1985) and are reportedly good predictors of early reading success (e.g., Lundberg, Olofsson, & Wall, 1980; Mann & Liberman, 1984).

All of the dependent measures involve different cognitive demands. Some involve memory skills, others processing skills. Although Clark (1978) has put forth a continuum describing linguistic awareness development, few researchers have contrasted the linguistic difficulty of phonological or word awareness tasks to each other. Stanovich, Cunningham, and Cramer (1984), however, reported rhyming tasks to be the least cognitively demanding of their ten phonological tasks. Tasks that required comparing initial sounds were somewhat easier than tasks requiring comparing final sounds. Their elision task, a task

requiring deleting the initial sound of words and saying the remaining word, was the most difficult.

Because Clark (1978) and Stanovich et al. (1984) suggest that rhyming tasks are cognitively less demanding than other phonological tasks, the Rhyme Supply task would appear to be the easiest of the four phonological measures used in this study. According to Clark's (1978) continuum it would appear that The Initial Consonant Same and Segmenting Sentences tasks were moderately difficult. The Generating Words and The Rosner tasks would be the most difficult tasks. Yopp (1988) contends that comparing phonological awareness tasks, with respect to task difficulty, is extremely difficult.

Procedure

Pretest and posttest measures were completed using the five selected subtests for both groups of children. Initial testing was completed between October 28th, and November 29th, 1991. The posttesting was completed between June 1st, and June 12th, 1992.

The five subtests were administered in twenty to thirty minute sessions. Subjects were tested individually, in a quiet room. The Rhyme Supply task was presented first, followed by the Initial Same Consonant task. The Segmenting Sentences subtest, and the Generating Words subtest were

then administered. The final task was the Rosner 13-Item Test. The majority of the testing was completed by the same examiner. One examiner was used to assess the children with presumed average language ability. This examiner also tested seven of the language-delayed children. Two other speech-language pathologists tested the remaining five language-delayed children.

All children received the following instructions when completing the five language subtests:

Rhyme Supply

Directions: We are going to listen to words and then say some words. First, I will say something and then I want you to say some words. "Fish," can you say "fish"? I can say "fish," "pish." Can you say "fish," "pish"? "Fish" and "pish" sound the same. They rhyme. Can you think of something that sounds the same as or rhymes with "fish" or "pish." (If child does not respond the examiner gives the child an initial sound prompt. For example, "fish," "d." If still no response, the examiner gives the child another example and an initial sound prompt. For example, "fish," "pish," "dish" and "w." If still no

response, the child is given another example, "pig" followed by "lig."

Let's try some more. Ready? "Nose." Can you say "nose"?

Initial Consonant Same

Directions: Now we are going to look at some pictures. Are you ready? This is a "goat." Can you say "goat"? Listen carefully. I want you to point to the picture that starts the same as "goat." Which one starts the same as "goat": "fish," "goose" or "truck"? (If incorrect, the examiner shows the child the correct response.)
Let's do some more.

Segmenting Sentences

Directions: Listen. "I like cookies" has three words: I ---like---cookies. The examiner moves three blocks while segmenting the sentence into three words.

Generating Words

Directions: Listen, I am going to tell you a word that starts with "t." Tie. Can you say a word that starts with ____?

Rosner 13-Item Test

Directions: Say "cowboy." Now say it again, but don't say "boy."

Data Analysis

Because the subjects used in this study were not assigned randomly to either the language-delayed or average language groups and because it was not possible to match them on important characteristics including age, language ability, intelligence, or socio-economic background, parametric statistics were not used. Instead, non parametric statistics were utilized. Two types of analyses were used. The powerful Mann-Whitney U Test (Loftus & Loftus, 1982) was used to compare the pretest posttest performances of the language-delayed children to children with average language ability. It was also used to determine growth differences between the two groups.

The Wilcoxon Matched-pairs Signed-Ranks Test was

selected to determine individual performance differences associated with the intervention program and test difficulty. Results of these analyses are presented in Chapter Four.

Assumptions and Limitations

When investigating the linguistic awareness abilities of language-delayed children relative to their average peers, the following assumptions were made:

1. Because of the time constraints of the study, it was assumed that the children in the average group had average language ability.
2. Both groups of children had average cognitive ability. The Halton Board of Education does not favour intellectual testing at the kindergarten level.
3. The children were exposed to minimal formal written language training.
4. All children in the average group would receive similar kindergarten programs.

Because of the time constraints of the study and job responsibilities of the primary examiner, it was not possible to control for all factors that affect the development of linguistic awareness such as age, language knowledge, kindergarten program, socio-economic status,

cognitive maturity and the lack of a control group for the language intervention program. Failure to match subjects, and the relatively small sample size, limit the generalizability of the findings to the language-delayed children used in this study. The findings are also limited by the fact that a second rater was not used to score the primary results.

CHAPTER FOUR: RESULTS

This chapter outlines the primary and secondary research findings. The primary analyses consisted of comparing pretest and postest performances between language-delayed and average students, as well as the growth differences (i.e., pretest - posttest difference scores). To determine if the two groups differed in the type of errors committed on the dependent measures, secondary analyses were completed. A secondary analysis was also completed to determine if the five dependent measures differed in their difficulty as measured by the children's performances.

Primary Analysis: Pretest Versus Posttest

The mean performance scores on the five dependent measures were converted into proportions and are presented in Tables 1 and 2 as a function of language condition (i.e., language-delayed versus average) and test time (i.e., pretest versus posttest). Mean ranks are also listed.

Five Mann Whitney U tests were carried out to determine whether the performances of the language-delayed children and average children differed across the five linguistic awareness tasks at pretest. There were significant differences for each task, favouring the children in the

Table 1. Pretest Mean Proportions, Standard Deviations, and Mean Ranks for the Five Dependent Measures.

Dependent Measure					
Language Group	Rhyme Supply	Initial Consonant Same	Segment-ing Sentences	Gener-ating Words	Rosner
Language-delayed (n = 12)					
M	.23	.40	.16	.07	.02
SD	3.68	2.09	.90	1.19	.87
M Rank	8.38	9.38	9.63	8.75	9.71

Dependent Measure					
Language Group	Rhyme Supply	Initial Consonant Same	Sement-ing Sentences	Gener-ating Words	Rosner
Average (n = 16)					
M	.79	.69	.34	.28	.15
SD	2.53	2.53	2.28	1.91	1.73
M Rank	18.50	17.70	17.50	18.20	17.43

Table 2. Posttest Mean Proportions, Mean Ranks, and Standard Deviations, and Mean Ranks for Language-delayed Children and Average Children Across the Five Dependent Measures.

	Dependent Measure				
Language Group	Rhyme Supply	Initial Consonant Same	Sement-ing Sentences	Gener-ating Words	Rosner
Language-delayed (n = 12)					
M	.77	.74	.42	.31	.28
SD	2.84	1.83	2.95	1.37	2.06
M Rank	11.67	12.46	11.67	12.29	12.50

	Dependent Measure				
Language Group	Rhyme Supply	Initial Consonant Same	Sement-ing Sentences	Gener-ating Words	Rosner
Average (n = 16)					
M	.90	.81	.53	.35	.24
SD	1.36	2.79	2.35	1.42	2.10
M Rank	185.87	15.23	15.87	15.37	15.20

average group (Rhyme Supply U = 22.5, p < .001; Initial Consonant Same U = 34.5, p < .01; Segmenting Sentences U = 37.5, p < .01; Generating Words U = 27, p < .005; Rosner U = 38.5, p < .004, where N1 = 12 and N2 = 15 for each language group).

Five Mann Whitney U tests were also completed to compare the posttest performances of the language-delayed children and average children across the five linguistic awareness measures. There were no significant differences between the two groups of children. In other words, the language-delayed group performed as well as the average group on each task (Rhyme Supply U = 62; Initial Consonant Same U = 71.5; Segmenting Sentences U = 62; Generating Words U = 69.5; Rosner U = 72, where N1 = 12 and N2 = 15 and p > .10 for each measure).

Growth Scores

The pretest and posttest difference scores for each task are presented in Table 3 as a function of language condition.

The Wilcoxon Matched Test was used to determine if there was a significant improvement between pretest and posttest mean rank difference scores for each group. Significant improvements were obtained for the language-delayed group across the five tests (Rhyme Supply z = -2.8,

Table 3. Mean Growth Scores and Standard Deviations for the Five Dependent Measures.

Dependent Measure					
Language Group	Rhyme Supply	Initial Consonant Same	Segment-ing Sentences	Gener-ating Words	Rosner
Language-delayed (n = 12)					
M	5.33	3.42	3.08	2.83	2.1
SD	3.77	3.09	2.94	1.47	1.88
Average (n = 15)					
M	1.33	1.20	2.33	.93	1.33
SD	1.55	1.57	2.02	1.22	1.30

$p < .005$; Initial Consonant Same $z = -2.7$, $p < .01$; Segmenting Sentences $z = -2.8$, $p < .005$; Generating Words $z = -3.1$, $p < .005$; Rosner $z = -2.5$, $p < .01$, where $N = 12$ for each measure). Significant improvements between pretest and posttest performance scores were also obtained for the average group (Rhyme Supply $z = -2.1$, $p < .05$; Initial Consonant Same $z = -2.4$, $p < .05$; Segmenting Sentences $z = -2.9$, $p < .005$; Generating Words $z = -2.0$, $p < .05$; Rosner $z = -2.5$, $p < .01$, where $N = 15$ for each measure).

The Mann Whitney U Test was also used to determine if the amount of growth differed between the two language groups for each task. There were no significant growth differences between the two groups on three of the five dependent measures (Initial Consonant Same $U = 55$; Segmenting Sentences $U = 85.5$; Rosner $U = 65.5$, where N1 = 12 and N2 = 15 for each language group and $p > .10$ for each measure). Significant differences, favouring the language-delayed group, were obtained on the Rhyme Supply and Generating Words tasks (Rhyme Supply $U = 36$, $p < .01$; Generating Words $U = 31$, $p < .005$, where N1 = 12 and N2 = 15 for each language group).

Secondary Analysis

Error Analysis

Rhyme Supply

Students' errors were analyzed for five common errors: association, unknown, common phrase, repetition, and undefined. An error that was related to the target word by meaning or its attributes was coded as an association. For example, if "bird" was said for "wing" it was scored as an association. Unknown was an "I don't know" response. If a target word was repeated it was coded as a repetition. A common phrase represented two or three words that sounded like a typical English expression. For example, the word "toe" in response to "tip" would be scored as a common phrase. All other errors were scored as undefined. Students' responses were scored by two independent raters. Interrater agreement for errors was 96%. Disagreements were resolved by discussion.

The mean scores for each type of error are presented in Table 4 as a function of language condition and test time. At pretest, the most common type of error for the language-delayed group was unknown. The average group's most common type of error was undefined. At posttest, however, the most common type of error for both groups was undefined.

Table 4. Pretest and Posttest Mean Error Scores and Standard Deviations for Each Type of Error Made on the Rhyme Supply Task.

Type of Error					
Test Time	Association	Don't Know	Repetition	Common Phase	Undefined
Language-delayed (n = 9)					
Pretest					
M	1.17	4.00	.50	.33	1.67
SD	1.80	3.91	.80	.65	1.44
Posttest					
M	.17	.83	.17	.08	1.08
SD	.39	1.53	.58	.29	1.16
Average (n = 15)					
Pretest					
M	.40	.00	.07	.07	1.67
SD	1.06	.00	.26	.26	1.84
Posttest					
M	.27	.13	.07	.00	.47
SD	.80	.52	.26	.00	.74

Wilcoxon Matched tests were completed to determine if the groups differed with respect to the types of errors committed on the Rhyme Supply task. For the language-delayed group at pretest, unknown errors occurred more frequently than did repetition or common phrase errors (Repetition z = -2.4; Common Phrase z = -2.3, where N = 12 and $p < .05$ for both measures). Undefined errors also occurred more frequently than did repetition or common phrase errors for the language-delayed group (where z = -2.4, N = 12 and $p < .05$ for both measures). For the average group, undefined errors occurred more frequently at pretest than did association, unknown, repetition, and common phrase errors (Association z = -2.03, $p < .05$; Don't Know z = -2.7, $p < .01$; Repetition z = -2.7, $p < .01$; Common Phrase z = -2.7, $p < .01$, where N = 15 for each measure). At posttest, both groups made more undefined errors than common phrase errors (Language-delayed z = -2.4; Average z = -2.0, where N1 = 12 and N2 = 15 for each language group and $p < .05$ for each measure).

Segmenting Sentences

At pretest and posttest, 78% of the children often counted two or more words as single words. For example, "were playing" and "the children" were often counted as one word rather than two words. Groups of words that were

counted as single words were coded grammatically. For example, the phrase "She can swim" was coded as a noun plus verb plus verb construction. The mean scores for selected types of grammatical constructions are listed in Table 5 as a function of test time.

At pretest, the most common type of error for both groups was the article plus noun construction. Twenty-six percent of the errors made by the language-delayed group were coded as an article plus noun construction. Forty-two percent of the errors made by the children in the average group were coded as an article plus noun construction. At pretest, the language-delayed group also made frequent errors on noun plus verb (9%) and preposition plus noun plus noun (10%) constructions. The average group at pretest made frequent errors on verb plus verb (13%) and pronoun plus noun (8%) constructions.

At posttest, the most common type of error for both groups was the article plus noun construction. Forty-one percent of the errors made by the language-delayed group were coded as an article plus noun construction. Forty-six percent of the errors made by the children in the average group were coded as an article plus noun construction.

Mann Whitney U tests were carried out to determine if the two language groups differed in the number of times they counted two or more words as single words. There were no significant differences between the groups at pretest or

Table 5. Pretest and Posttest Mean Error Scores and Standard Deviations for Segmenting Sentences.

Type of Error					
Test Time	Article Plus Noun	Noun Plus Verb	Preposition Plus Noun Plus Noun	Verb Plus Verb	Pronoun Plus Noun
Language-delayed (n = 9)					
Pretest					
M	3.00	.89	.89	.44	.44
SD	1.66	1.36	1.05	.53	1.01
Posttest					
M	2.00	.00	.11	.33	.22
SD	1.32	.00	.33	.71	.67
Average (n = 15)					
Pretest					
M	3.13	.20	.33	.93	.60
SD	2.61	.41	.49	1.03	.91
Posttest					
M	1.40	.47	.00	.13	.07
SD	1.84	.92	.00	.35	.26

posttest (Pretest U = 51.5; Posttest U = 56.5, where N1 = 9 and N2 = 15 for each language group and p > .10 for both measures).

Wilcoxon Matched tests were carried out to determine if there were significant differences within groups for counting two or more words as one word. Significant differences were obtained for each group such that more errors were made at pretest versus posttest (Language-delayed z = -2; Average z = -2.1, where N1 = 9 and N2 = 15 for each language group and p < .05 for each measure).

Mann Whitney U tests were also completed to determine if the groups differed in their ability to count multisyllabic words as single words. No significant differences were found between the groups at pretest or at posttest (Pretest U = 79.5, Posttest U = 84, where N1 = 12 and N2 = 15 for each language group and p > .10 for each measure). There were no significant differences within groups (Language-delayed z = -1, Average z = -.91, where N1 = 12 and N2 = 15 for each language group and p > .10 for each measure).

Generating Words

Because the first four items of this task (i.e., those requiring children to generate a word that started with an initial sound) revealed no obvious differences between the

two groups, the errors committed on these items were not analyzed. However, the eight items requiring children to generate a word that ended with a particular sound were analyzed. For example, children were asked to say a word that ended with "m." Students' responses were scored for three types of errors: initial sound, unknown, and other. An initial sound error represented words that started with the target sound. For example, if the children responded with "mouse" for a word that was to end with a "m," it was scored as an initial sound substitution. Unknown was an "I don't know" response. Errors that did not fit these two categories were coded as other. The mean error scores are presented in Table 6 as a function of language condition and test time.

For the language-delayed group the most common type of pretest error was unknown, whereas, for the children in the average group the most common error was an initial sound substitution. At posttest, however, the most common types of errors for both groups were unknown and initial sound.

Wilcoxon Matched tests were used to determine if the groups differed with respect to the types of errors committed across the eight items. At pretest, the average group made more initial sound errors than other errors: $\underline{z}$ = -3.2, (N = 15); $\underline{p} < .005$. At posttest, both language groups made more initial sound errors than other errors (Language-delayed $\underline{z}$ = -2.0, $\underline{p} < .05$; Average $\underline{z}$ = -3.0, $\underline{p} < .005$, where

Table 6. Pretest and Posttest Mean Error Scores and Standard Deviations Generating Words.

Type of Error			
Test Time	Initial Sound	Unknown	Other
Language-delayed (n = 11)			
Pretest			
M	2.38	.13	2.25
SD	1.19	.64	1.28
Posttest			
M	4.38	4.25	1.38
SD	2.39	1.49	.74
Average (n = 15)			
Pretest			
M	.10	2.50	1.50
SD	2.2	.76	1.07
Posttest			
M	6.38	5.13	1.50
SD	3.20	1.73	2.07

N1 = 11 and N2 = 15 for each language group). The average group also made more unknown errors than other others: z = -2.5, (N = 15); $p < .01$.

The Mann Whitney U test was selected to determine if there were significant differences between the two language groups as a function of the total number of errors. There was a significant difference at pretest, favouring the average group, (Pretest $U = 51$, $p < .05$; Posttest $U = 67$, $p > .10$, where N1 = 11 and N2 = 15 for each language group).

The Wilcoxon Matched test revealed no significant differences within the groups for the total number of errors made on the eight items (Language-delayed $z = -1.8$; Average $z = -1.2$, where N1 = 11 and N2 = 15 for each language group and $p > .10$ for each measure).

Task Difficulty

Descriptively, the children's pretest and posttest performances on the five dependent measures suggested that the Rosner was the most challenging task. Following this, children made the most errors on the Generating Words, Segmenting Sentences, and then the Initial Consonant Same tasks respectively. The language-delayed group made the least errors on the Initial Consonant Same task, whereas the children in the average group made the least errors on the Rhyme Supply task.

Pretest

Wilcoxon Matched tests were used to determine if the five dependent measures differed in their difficulty as measured by children's performances. It appeared that the language-delayed children found the Rosner as challenging as Generating Words: $z = -1.4$, ($N = 12$); $p > .10$. It also appeared that the Rhyme Supply task was as difficult as Segmenting Sentences and Generating Words tasks for these children (Segmenting Sentences $z = -.2$, $p > 10$; Generating Words $z = -1.1$, $p > .10$, where $N = 12$ for each measure). For the children in the average group, Segmenting Sentences appeared to be as challenging a task as Generating Words: $z = -1.1$, ($N = 15$); $p > .10$. The Rhyme Supply and Initial Consonant Same tasks appeared equally challenging for both language groups (Language-delayed $z = -1.4$, $p > .10$; Average $z = -1.6$, $p > .10$, where N1 = 12 and N2 = 15 for each measure).

Posttest

Wilcoxon Matched tests were also completed at posttest to determine if the five dependent measures differed in their difficulty as measured by children's performances. For the language-delayed group, the Rosner appeared as challenging a task as Generating Words: $z = -1.9$, ($N = 12$);

$p > .05$). Segmenting sentences was also as challenging as Generating Words for these children: $z = -1.4$, ($N = 12$); $p > .10$. Across both language groups, the Rhyme Supply and Initial Consonant Same tasks appeared to be equally as difficult (Language-delayed $z = -.3$, $p > .10$; Average $z = -1.5$, $p > .10$, where N1 = 12 and N2 = 15 for each measure).

In summary, there were significant pretest differences favouring the children in the average group. At posttest, there were no significant performance differences between the two groups. Both language groups made significant performance improvements from pretest to posttest. The two language groups did not differ in the amount of growth they each obtained between pretest and posttest.

CHAPTER FIVE: DISCUSSION

This chapter will present a discussion of the findings as they relate to the previous research. Implications for education and future research suggestions will also be addressed.

Summary of Findings

The purpose of this study was to examine the phonological and word awareness skills of language-delayed children as a function of their participation in a language intervention program. Pretest and posttest language performance scores of the language-delayed children were compared to the performances of average children, who did not participate in the language intervention program.

Overall, the intervention program facilitated the phonological and word awareness skills of language-delayed children. Prior to the intervention program, the language-delayed children performed poorly on the phonological and word awareness tasks relative to their average peers. At posttest, the language groups did not differ in their performances on the word and phonological tasks. While both groups demonstrated performance gains over the eight-month interval, improvement gains on the Rhyme Supply and Generating Words tasks were significantly greater for the

language-delayed group than for the children in the average group. It appeared that the Rosner was the most difficult task for both groups of children as indicated by performance scores. The children performed similarly on the Rhyme Supply and Initial Consonant Same tasks.

Pretest Versus Posttest Performance Scores

In general, the pretest performance scores of both groups of children were consistent with previous research (e.g., Kamhi & Catts, 1986; Kamhi, Lee, & Nelson, 1985; Warrick & Rubin, 1992). As expected, the language-delayed group performed more poorly on phonological and word awareness tasks than did their average peers. This is most likely the result of the language-delayed children's weak expressive language skills (Kamhi & Koenig, 1985). At pretest these children omitted words and sounds, and made grammatical errors which may have contributed to their difficulty manipulating and analyzing words, syllables, and sounds. For example, the children may have said "He coming" for "He is coming" or "pider" for "spider."

Although previous research primarily investigated the effects of training phonological awareness on average children's phonological awareness development (Ball & Blachman, 1988; Bradley & Bryant, 1983; Lundberg, Frost, & Petersen, 1988), the posttest findings of the present study

support the notion that phonological and word awareness skills can be enhanced for some language-delayed populations. That is, a language intervention program can facilitate the phonological and word awareness skills of children who have delayed expressive language development.

It is encouraging that language-delayed children are capable of improving their word and phonological awareness skills. In fact, after participating in a language intervention program, these children achieved the same level of success on phonological and word awareness tasks as their average peers. The latter finding suggests that language intervention programs which provide children with phonological and word awareness activities can enhance these students' phonological and word awareness skills to a level of their average peers. It would be interesting to examine the effects of a phonological awareness program that is used daily with language-delayed children. Given the findings from the present study, the phonological and word awareness skills of language-delayed children may be developed even further with daily intervention.

These findings should be considered somewhat cautiously as it was not possible to match the two groups of children on critical factors, such as exposure to phonological and word awareness activities at home and/or in school which may have contributed to the success of the language-delayed children. For example, because the language-delayed

children attended different kindergarten classes, they may or may not have been exposed to rhyming or sound-symbol games in their regular kindergarten program. This exposure or lack of exposure may have influenced the children's performances on the phonological tasks.

Growth Differences

Not only did the language-delayed children perform as well as their average peers at posttest, they also made as much progress as the average group across the five measures. Growth gains for average children have been noted by other researchers (e.g., Fox & Routh, 1975; Rubin, Mallory & Farndale, 1987). In other words, phonological and word awareness skills develop as children mature. This also appears to be true for language-delayed children who participate in a language intervention program.

Error Analysis

Although the language-delayed children performed as well as the average children at posttest, there were differences in the types of errors made by the two groups of children at pretest and posttest on the Rhyme Supply, Segmenting Sentences, and Generating Words tasks.

Rhyme Supply

Examination of the errors on the Rhyme Supply task suggests that the language-delayed children not only performed more poorly than the average group at pretest, but that their errors were not as sophisticated. That is, when asked to provide a rhyming word for 10 target words, 52% of the errors made by the language-delayed children were "don't know" responses, whereas the average children's most common error (76%) was categorized as undefined (i.e., a word not related in meaning or sound to the target word). This suggests that the average group may have been more willing to take a risk and/or had a better understanding of the task requirements (i.e., realized that they needed to say a word). On the other hand, the language-delayed group may have been uncertain of the task requirements. At posttest, however, 46% of errors made by the language-delayed children were coded as undefined. Fifty percent of the errors made by the children in the average group were coded as undefined. There also appeared to be a decrease in the number of unknown (i.e., don't know) responses for the language-delayed group. Not only did the language-delayed group perform as well as the average children at posttest, but their errors were also similar to their average peers' errors.

Segmenting Sentences

At pretest and posttest, both groups of children tended to count two or three words as single words on the Segmenting Sentences task. At pretest, 26% of the errors made by the language-delayed group were coded as an article plus noun construction. Forty-two percent of the errors made by the children in the average group fell into the same category. At posttest, the article plus noun error was again the most common type of error for both groups. Forty-one percent and 46% of the errors made by the language-delayed group and children with average ability, respectively were coded as an article plus noun construction.

At posttest, both language groups demonstrated a decrease in the number of times they counted two or three words as single words. Because the language-delayed children made many expressive syntactical errors at the beginning of the study, it was assumed that they would commit more of this type of error (Kamhi, Lee, & Nelson, 1985). The failure to find differences between the language groups for this type of error suggests that counting two or more words as a single word may reflect a developmental progression for all children and may not be a direct result of delayed expressive language skills.

There were also 17 multisyllabic words that were often

counted as two or more words by the children. For example, because the word "swimming" has two syllables, some children counted this word as two words. Again, it was found that the language-delayed children made the same number of errors on the multisyllabic words at pretest and at posttest as did children in the average group. Although the language-delayed children appeared to have trouble expressing multisyllabic words throughout the intervention period, this finding suggests that difficulty expressing multisyllabic words does not affect children's ability to segment sentences into words. In fact, it appears that segmenting sentences with multisyllabic words are just as difficult for average children as they are for language-delayed children.

Generating Words

Although the language-delayed children made more pretest errors on the eight items requiring children to generate a word that ended with a particular sound (i.e., say a word that ends with a "m"), there were no differences between the groups at posttest. This suggest that language-delayed children, who participate in a language intervention program, begin to make the same errors as their average peers for these task items.

An analysis of the type of errors committed on these eight items suggests that language-delayed children's errors

resemble the errors made by their average peers. The most common error for the language-delayed group at pretest was "don't know" (61%), whereas the average children responded more frequently with a word that started with the target sound (71%). However, at posttest the most common errors for the language-delayed group were initial sound (44%) and "don't know" (42%). In the average group, the children's most common errors were initial sound (49%) and "don't know" (39%). In fact, language-delayed children made more initial sound errors than errors coded as "other." It was interesting that the average children made more "don't know" errors than other errors at posttest, whereas at pretest there was no difference between these two types of errors. This may be attributed to the average children's increased awareness of the task demands at posttest. In other words, at pretest the average children may have been more willing to generate initial sound errors compared to other errors because they did not fully understand the task. However, at posttest, they may have been fearful of making a mistake.

Task Difficulty

Pretest

In general, both groups of children found the Rosner to be the most challenging task as indicated by low performance

scores. Generating Words and then Segmenting Sentences appeared to be moderate in their difficulty, with the Initial Consonant Same and the Rhyme Supply tasks appearing to be the easiest.

A close examination of the performance scores revealed that the language-delayed children performed as well on the Rhyme Supply as the Initial Consonant Same, Segmenting Sentences, and Generating Words tasks. The average children performed as well on the Rhyme Supply task as the Initial Consonant same task. The language-delayed group performed similarly on the Generating Words and Rosner tasks. These findings are not consistent with previous research. That is, rhyming tasks have been reported as the easiest of the phonological awareness tasks, with tasks similar to the Rosner being reported as the hardest (Clark, 1978; Lewkowicz, 1980; Stanovich et al., 1984). These findings suggest that language-delayed children are truly disadvantaged when asked to complete phonological and word awareness tasks. For example, at pretest, there were no differences between the performances of the language-delayed children on the easiest phonological awareness task (i.e., rhyming) and tasks that appeared to be moderately difficult.

On the other hand, the average children's findings were fairly consistent with previous findings (Clark, 1978; Fox & Routh, 1975; Stanovich et al., 1984). Three levels of difficulty were found for the average group. That is, the

Rhyme Supply and Initial Consonant Same Tasks appeared to be the easiest to complete. Segmenting Sentences and Generating Words were associated with moderate difficulty, with the Rosner being the most difficult.

Posttest

The sequence of task difficulty at posttest was similar for both groups. That is, performance scores suggested that the Rosner was the most challenging task. Segmenting Sentences and then Generating Words appeared to be moderate in their difficulty, with the Rhyme Supply and Initial Consonant Same tasks appearing to be the easiest tasks. Although, the children in the average group appeared to find the Rosner the most challenging task, the language-delayed children appeared to find Generating Words and the Rosner to be equally challenging. This sequence of task difficulty is supported by previous research (e.g., Fox & Routh, 1975; Stanovich et al., 1984).

It was interesting that both groups of children performed similarly on the Rhyme Supply and Initial Consonant Same tasks at pretest and at posttest. Because the Initial Consonant Same task involved referring to pictures and the Rhyme Supply did not require children to hold onto words, they appeared to demand very little from working memory. These tasks also did not require direct

sound analysis (Lewkowicz, 1980). Tasks similar to the Rhyme Supply and Initial Consonant Tasks are often considered to be fairly easy phonological awareness tasks (Lewkowicz, 1980; Yopp, 1988). The pretest and posttest performance scores are not consistent with Stanovich et al.'s (1984) work, who reported a difference in performance scores on Rhyme Supply and Initial Consonant tasks. However, for the present study, the Initial Consonant Same task was simplified by providing pictures for the possible answers. This may have decreased the working memory demands, and may have resulted in making the test cognitively similar to the Rhyme Supply task (Schneider & Pressley, 1989). This is an interesting finding as it suggests that decreasing the memory demands changes not only the difficulty of the task, but also makes it appear similar to a task that is supposedly quite different. However, it is difficult to determine if the differences in the performances are a result of memory, cognition, or phonological ability.

A review of the research suggests that Segmenting Sentences should be easier to complete than Generating Words. Because segmenting sentences into words does not require direct sound analysis or manipulation, it has been reported to be easier to complete than most phonological awareness tasks (e.g., Fox & Routh, 1975). Generating Words requires children to find a word and compare it to a target sound. These skills appear to demand sound manipulation and

analysis skills (Lewkowicz, 1980).

Although Yopp (1988) has suggested that comparing the level of difficulty of one phonological awareness task with another is almost impossible, most researchers (e.g., Fox & Routh, 1975; Lewkowicz, 1980; Stanovich et al., 1984) agree that tasks like the Rosner are fairly difficult phonological awareness tasks because they demand direct sound manipulation and analysis. Because cognitive demands may vary from one task to the other (Lewkowicz, 1980; Yopp, 1988), the proposed sequence for task difficulty should be interpreted cautiously.

In summary, it is clear that language-delayed children are capable of developing word and phonological awareness abilities that are at the same level as their average peers. In addition, language-delayed children's errors appear to resemble the errors made by their average peers following the intervention period. The sequence of task difficulty also seems to be the same for both groups of children.

Implications for Education

Curricula

This study revealed that the phonological and word awareness skills of language-delayed children could be facilitated by having them participate in a language

intervention program that exposes them to phonological and word awareness activities. This finding is consistent with other research (e.g., Bradley & Bryant, 1983; Lundberg, Olofsson, & Wall, 1980; Mann & Liberman, 1984), and suggests that the inclusion of phonological and word awareness activities in the regular program may improve phonological awareness skills and subsequent reading ability for all kindergarten children. Because language-delayed children and reading-disabled children often show deficits in their phonological and word awareness development (e.g., Kamhi & Catts, 1986; Kamhi et al., 1988), it would be beneficial to include these activities into the regular language arts program (Ball & Blachman, 1988; Bradley & Bryant, 1983; Lundberg, Frost, & Petersen, 1988). This would be especially important in settings that do not offer additional support for language-delayed and reading-disabled children.

Likewise, the demands of classroom activities, with respect to phonological and word awareness knowledge, may also need to be more closely evaluated. Many regular classroom activities, such as sound to word matching, involve phonological awareness (Adams, 1990; Lewkowicz, 1980; Griffith & Olson, 1992). However, because teachers may not fully understand why students are unable to match the sound to a word, they may not know how to help children develop the skills needed for this task, or other tasks,

that require phonological and word awareness ability. In order to plan appropriate programs, teachers need to be aware of the phonological and word awareness demands of everyday language-related activities.

Finally, the importance of phonological awareness for early reading success should be shared with teachers. Educators also need to be made aware of the tasks they already use in the classroom that promote phonological awareness, and new tasks that they can include into the daily program. For instance, rhyming or alliteration games can be easily included into the daily experiences of children. For example, if the theme of the classroom is "spiders," than the spider web game suggested by Olofsson and Lundberg (1983) could be used. In this game the teacher has a ball of wool and says a sound (e.g., "m"), followed by a word (e.g., "ice"). The teacher then throws the ball to a child who is asked to say the new word. Teachers can also expose children to literature that promotes rhyming or word play, and draw children's attention to sound manipulations through follow-up activities. For example, after reading Down by the Bay (Raffi, 1987) the children could make their own books using new rhymes.

Intervention

The improvement demonstrated by the language-delayed children after participation in the language intervention program reinforces the importance of including phonological and word awareness activities in remedial programs. Activities used in language intervention programs should include those that promote phonological and word awareness skills, in addition to those that focus on developing the receptive, expressive, and conversational skills of language-delayed children.

Because language-delayed children often have poorly developed phonological and word awareness skills (e.g., Kamhi, Lee, & Nelson, 1985; Warrick & Rubin, 1992), the phonological awareness demands of present language assessment tools should be reexamined. Flood and Salus (1982) report that speech-sound discrimination tasks often used as part of expressive language batteries require children to analyze and compare the sounds of two words. These processes require some phonological awareness. Therefore, language-delayed children may perform poorly on language tests as a function of poorly developed phonological and/or word awareness skills rather than impairments in basic language skills. In other words, language tests may demand phonological awareness skills rather than basic language skills (Flood & Salus, 1982).

The findings also suggest that language assessments should include tasks that specifically examine phonological and word awareness abilities of children. This will not only help establish the phonological abilities of the children, but it may also facilitate the development of appropriate intervention goals.

Implications for Future Research

Although these results suggest that some language-delayed children are capable of developing the same phonological and word awareness skills as average children, further research is needed. Specifically, there is an urgent need for studies to replicate the present study and control for other factors that influence the development of phonological and word awareness, including attentional capacity and maturity. By using a control group for the language intervention program, the effects of maturation could be examined. On the other hand, clinical experience suggests that it is unlikely that language-delayed children will make phonological and word awareness progress without direct support. Although a language intervention control group was investigated at the onset of this present study, it was not utilized because of the lack of a waiting list for the intervention. That is, all the children referred to the program received support. Also, the Halton Board of

Education would not support withholding intervention from the language-delayed children. It would also be of interest, particularly to those designing language intervention programs, to examine differences between children with receptive and expressive language delays, and to compare the performance of these children across many phonological awareness tasks.

Because only four phonological awareness tasks and one word awareness task were used in this study, future research should include more tasks and tasks that represent different levels of task difficulty. These insights would facilitate choosing appropriate materials to assess children's phonological and word awareness skills. It would also help educators plan better language programs and help establish a hierarchy of phonological awareness skills.

The results from the present study may motivate educators and practitioners to evaluate the effects of training programs that focus exclusively on the development of phonological and word awareness skills of children. Intervention programs that offer word and phonological awareness activities intermittently would be compared to language intervention programs that offer daily, well structured phonological and word awareness activities. For example, the phonological training program used by Ball and Blachman (1988) or Lundberg, Frost, and Petersen (1988) could easily be examined. It is likely that a daily program

would further advance the phonological and word awareness skills of language-delayed children compared to a program that uses tasks incidentally.

It would also be of interest to examine the children's spontaneous use of phonological and word awareness skills following an intervention program. That is, comparing a spontaneous language sample taken at pretest to one collected at posttest.

Although these results are encouraging, more research into whether or not language-delayed children maintain their growth should also be completed. Specifically, follow up studies would help establish the long-term effects of training programs, especially with respect to reading acquisition...a skill well known to be positively correlated with academic achievement.

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